Title: STACKED FLIP-ASSEMBLED SEMICONDUCTOR CHIPS EMBEDDED IN THIN HYBRID SUBSTRATE

Abstract: A semiconductor system having a substrate (101) including a rigid insulating interposer (110) with a high modulus and a top (140) and a bottom (150) low-modulus tape with flip-attached semiconductor chips (120, 130). The assembled chips, with the passive surfaces facing each other, are located in an opening (114) of the interposer, which has a thickness (111) equal to or smaller than the sum of the assembled two chips. Adhesive material (160) holds the tapes parallel to the interposer and the chip surfaces together. Solder balls (180) and discrete components (170) may be attached to the outside surfaces of the tapes.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
   IPC(8) - H01L 25/065 (2008.04)
   USPC - 257/686; 257/737

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
   IPC(8) : H01L 25/065 (2008.04)
   USPC : 257/686; 257/737

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
   USPC : 257/686; 257/737, search terms below

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
   PubWEST (USPTO,PQIP,EPAB,JPAB); Google Scholar, Google
   Search Terms: interposer modulus substrate epoxy adhesive temperature conductive tape via thickness GPa tape metal semiconductor

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>US 2006/0110927 A1 (Masumoto et al.) 25 May 2006 (25.05.2006), paras [0007], [0023], [0026], [0030] and [0075],[0076]</td>
<td>1-8, 9a, 9b, 10-16</td>
</tr>
<tr>
<td>Y</td>
<td>US 7,005,316 B2 (Lee et al.) 28 February 2006 (28.02.2006), Abstract, col 1 45-48, 61-62; col 3 ln 8-10, 36-38, 43-52, 56-62; col 5 ln 4-6, 10-11, 15-16, 52-57; col 7 ln 39-41 and col 9 ln 2-5</td>
<td>1-8, 9a, 9b, 10-16</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C.

- Special categories of cited documents:
  - "A" document defining the general state of the art which is not considered to be of particular relevance
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  - "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  - "O" document referring to an oral disclosure, use, exhibition or other means
  - "P" document published prior to the international filing date but later than the priority date claimed
  - "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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  - "&" document member of the same patent family

Date of the actual completion of the international search
17 April 2008 (17.04.2008)

Date of mailing of the international search report
16 May 2008

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